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Applicants: David White

Serial No.: 10/666,807

Filed: September 18, 2003

Title: COMPOSITIONS, KITS AND METHODS FOR PROGNOSTICATION,  
DIAGNOSIS, PREVENTION, AND TREATMENT OF BONE-RELATED  
DISORDERS AND OTHER DISORDERS

Attorney/Agent: Kerri Pollard Schray

Docket No.: MPI99-130PIRCNIM

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H -----MGPTLAVPTPYGCIGCKLPQPEYPPALIIIFMFCAMVITIVVDLIGNSMVILAVTKNKKLRNS  
M MATVPKSNMGPTKAVPTPFGCIGCKLPKDPYPPALIIIFMFCAMVITIVVDLIGNSMVILAVTKNKKLRNS  
R -----  
  
H GNIFVVSLSVADMLVAIYPYPLMLHAMSIGGWDLSQLQCQMVGEITGLSVVGSIFNIVAIAINRYCYICH  
M GNIFVASLSVADMLVAIYPYPLMLYAMSVGGWDLSQLQCQMVGLVTGLSVVGSIFNITAIAINRYCYICH  
R -----YCYICH  
  
H SLOYERIFSVRNTCIYLVITWIMTVLAVLPMYIGTIEYDPRTYTCIFNYLNNPVFTVIVCIHFVLPPL  
M SLQYKRIFSLRNTCIYLVVTVWMTVLAVLPMYIGTIEYDPRTYTCIFNYVNNPAFTVIVCIHFVLPPL  
R SLQYNADLQPANTCIYLVVTVWMTVLDVLPNVYIGTIEYDPRTYTCIFNYVNNPAFTVIVCIHFVLPPL  
  
H IVGFCYVRIWTKVLAARDPAGQNPNDQLAEVNFLTMTFVIFLLFAVCWCPCINVLTVLVAVSPKEMAGKIP  
M IVGYCYTKIWKVLAARDPAGQNPNDQFAEVNFLTMTFVIFLLFAVCWCPCVNVLTVLVAVIPKEMAGKIP  
R IVGYCYTKIWKVLAARDPAGQNPNDQFAEVNFLTMTFVIFLL-----  
  
H NWLYLAAYFIAYFNNSCLNAVIYGLLNENFRREYWTIFHAMRHPPIIFFPGLISDIREMQEARTLARARAH  
M NWLYLAAYCIAYFNNSCLNAIIYGILNESFRREYWTIFHAMRHPILFISHLISDIRETWETRALTRARVRA  
R -----  
  
H RDQAREQDRAHACPAVEETPMNVVRNVPLPGDAAAGHPDRASGHPKPHSRSSAYRKSASTHHKSVFHSK  
M RDQVREQERARACVAVEGTPRNVVRNVLLPGDASAPHSDRASVRPKPQT-----RSTSVYRK  
R -----

Fig. 1A

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```
H  AASGHLKPVSGHSPASGHPKSA-TVYPKPASVHFKGDSVHFKPDSVHFKPASSNPKPITGHH
M  PASIHHKSI SGHPKASVYPKPASSVHCKPASVHFKPASVHFKGDSVYFKGDTVHYRAAS---KLVTSHR
R  -----

H  VSAGSHSKSAFSAATSHPKP-----IKPATSHAEP T TADY PKPAT TSHPKPAAADNP ELSASHCPEI PAIA
M  ISAG-----PSTSHPTSMAGYIKSGTSHPAT TTV DYLEPAT TSHSVLTAVDLPEVSASHCLEMENTSTG
R  -----

H  HPVSDSDLPESASSPAAGPTKPAASQLESDT IADLPDPTVVTTSTNDYHDVVVD----VEDDPDEMAY
M  HLRAD-----ISASVLPSPVFFELAATP-----PDTTAIPIASGDYRKVVLLIDDDSDDCSDEMAY
R  -----
```

Fig. 1B

TGTTTGTGCTGGACCTGGCTGATCCTGAGCCTGCTGGGAGATCTTAACGATCCCCAGGAGCAACATGGGGCCCCACCCCTAG  
CGGTTCCCAACCCCTATGGCTGTATTGGCTGTAAAGCTACCCAGCCAGAAATACCCACCGCTCTAATCATCTTTATGTTCTGCGC  
GATGGTTATCACCATCGTTGTAGACCTAATCGGCAACTCCATGGTCATTTTGGCTGTGACGAAGAACAAAGCTCCGGAATCT  
GGCAACATCTTCTGTCAGTCTCTCTGTGGCCGATATGCTGGTGGCCATACCCCATACCCCTTTGATGCTGCTGCAATGTCCTCA  
TTGGGGGCTGGGATCTGAGCCAGTTACAGTGCCAGATGGTGGGTTTCATCACAGGGCTGAGTGTGCTGGCTCCCATCTTCAACAT  
CGTGGCAATCGCTATCAACCGTTACTGCTACATCTGCCACAGCTCCAGTACGAACGGATCTTCAGTGTGCGCAATACCTGCAATC  
TACCTGGTCATCACCTGGATCATGACCGTCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCT  
ACACCTGCATCTTCAACTATCTGAACAACCCCTGCTTCACTGTTACCATCGTCTGCATCCACTTCTGCTGCTGCTGCTGCTGCTGCTGCT  
GGGTTCTGCTACGTAGGATCTGGACCAAGTGTGGCGGCCCTGACCCCTGCAGGGCAGAAATCTTGACAAACCAACTTCTGCTGAG  
GTTTCGCAATTTCTAACCATGTTTGTGATCTTCTCCTCTTTCAGTGTGCTGGTGGCCCTATCAACGTGCTCACTGCTTGTGTGG  
CTGTCAGTCCGAAGGATGGCAGGCAAGATCCCCAAGTGGCTTTATCTTGACGCTACTTCATAGCCTACTTCAACAGCTGCCT  
CAACGCTGTGATCTACGGGCTCCTCAATGAGAAATTCGGAAGAGAAATCTGGACCATCTTCCATGCTATGCGGCACCCCTATCATA  
TTCCTCCCTGGCTCATCAGTGATATTCTGTGAGATGCAGGAGGCCCGTACCCCTGGCCCGCCCGTCCCATGCTCGCGACCAAG  
CTCGTGAACAAGACCGTGCCCATGCT  
TGCAAGTGGCCACCCGACCGTGCCTCTGGCCACCCCTAAGCCCATTCAGATCCTCCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCT  
CACCAAGTCTGTCTTTAGCCACTCCAGGCTGCCCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCT  
ACCCCAAGTCTGCCACTGTACCCCTAAGCCTGCCCTCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCT  
TTTCAAGCCTGACTCTGTTTCAATTCAGCCTGCTTCCAGCAACCCCAAGCCCATCACTGGCCACCATGCTGCTGCTGCTGCTGCTGCT  
TCCAAGTCTGCCCTTCAAGTGTGCCACCAAGCCACCCCTAAACCCATCAAGCCAGCTACAGCCATGCTGAGCCCAACCACTGCTGACT  
ATCCCAAGCCTGCCACTACCAAGCCACCCCTAAGCCCGTGTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCTGCT  
TGCCATTGCCCCACCTGTGCTGACGACAGTGACCTCCCTGAGTCGGCCTCTAGCCCTGCGGCTGGCCCAACCAAGCCTGCTGCTGCT  
AGCCAGCTGGAGTCTGACACCATCGCTGACCTTCCCTGACCCCTACTGTAGTCACTACCAAGTACCAATGATTACCATGATGCTGCTGG  
TTGTTGATGTTGAAGATGATCCTGATGAAATGGCTGTGTGAAAAATGCTCTCGTAGGTGGCCAGGCAGT

Fig. 2A

AAAGATCCTGAGCTTGCCTGGGAGGAATGGCCACGGTCCCAGAGCAACATGGGACCTACAAAGCGGTTCCCACCCCATTCGGC  
TGCAATTGGCTGAAGCTGCCAAGCCGACTACCCGCCAGCTCTAATCATCTTCAATGTTCTGCGAATGGTCATCACAGTCGTG  
TAGACCTGATCGGGAACTCCATGGTCAATTTGGCTGTGACCAAGAAGCTCCGAAATCTGGCAACATCTTTGTGGCCAG  
CCTCTCTGTGGCAGACATGCTGGTGGCCATCTACCCCTACCCCTTTGATGCTGTATGCCATGTCAGTTGGGGCTGGGATCTGAGT  
CAGCTCCAGTGCCAGATGTCGGGTTGGTCACAGGACTGAGCGTAGTCGGTTCATCTTCAACATTACTGCCATTGCCATCAACC  
GTTACTGCTACATCTGCCACAGCCTCCAATACAAGCGGATCTTCAGCCTGCGCAACACTTGCACTATCTGTCGTTACCTGGGT  
CATGACTGTCCTGGCTGTCCTGCCTAACATGTACATTGGCACCATTTGAGTATGACCCCTGCACCTACACCTGCATCTTCAACTAT  
GTGAACAATCCTGCCCTTACCGTGACCATTTGCTGCATCCACTTCGTCTCCCTCTCATCATAGTTGGTTATTGCTACACGAAAA  
TCTGGATCAAAAGTGCTGGCAGCCCCGTGACCCAGCTGGACAGAACTCTGACAAACAGTTTGCTGAGGTCGAAATTTTCTAACCCAT  
GTTTGTGATCTTCCTCTTTTGCAGTTGCTGGTGCCCTGTCAATGTGCTCACTGTGTGGTGGTGTCTATCCAAAGGAAATGG  
CAGGCAAGATCCCCAACTGGCTTTATCTTGAGCCTACTGCATAGCCTACTTCAACAGCTGCCCTCAACGCCATCATCTACGGTAT  
CCTCAATGAGAGTTTCCGAAGAGAAATACTGGACCATCTTCCATGCTATGGCGACCCCTATCCTGTTCTATCTCTCACCTCATCAGT  
GATATTCGGGAGACTTGGGAGACCCGAGCTCTCACTCGTGCCCGTGTCGGTGATCAAGTCCGAGAGCAAGAGCGTGTCTC  
GTGCCCTGTGTCGTGGAGGGGACCCCAAGGAACGTCCGGAATGTTCTACTGCCCTGGTGATGCATCAGCACCCCACTCTGATCG  
TGCCCTCTGTCCTCCCAAGCCCCAAACCAAGGTCTACTTCTGTCTACCGCAAACTGCCCTCTATCCACCACAAGTCTATTTCTGGC  
CACCCCAAGTCTGCCCTGTGTTACCCCTAAGCCAGCCTCCTCTGTCCATTGCAAGCCTGCCCTCTGTCCATTCAAACCCGCCCTCTG  
TTCAATTTCAAGGTGACTCTGTCTATTTCAAGGGAGACACTGTCCATTACAGGGCTGCTTCCAAACTTGTCAACAGTCACCCGTAT  
CTCTGCTGGCCCTTCCACCAGTCACCCCTACATCCATGGCTGGCTACATTAAATCTGGTACCAGCCACCCCTGCCACCACCACTGTT  
GACTATCTCGAACCTGCCACCACCGACCATCTGTGCTCACTGTGCGACCTCCCTGAGGCTCTCAGCCTCCCATTGCCCTTGAGA  
TGACCAGCACTGGCCACCTCAGAGCTGACATTTCTGCCCTGTGCTTCTGTTACCCCTTCGAGCTTGCTGCCACCCCTCCTGA  
TACCACCTGCAATCCCCATTGCCCTCTGGTGATTACCGCAAGGTGCTGCTTATTGATGATGATTCTGATGATTCTGCTCTGAT  
CAGATGGCTGTGTA

**Fig. 2B**

TACTGCTACATCTGCCACAGCCCTCCAGTACAATGCGGATCTTCAGCCCTGCTAACACTTGCACTCTATCTGGTTGTTACCTGGGTCA  
TGACTGTTCTGGATGTCCTGCCCTAAATGTGTACATTTGGCACCCATTGAGTATGACCCCTCGCACCTACACCTGCTACTTCAACTATGT  
GAACAACCCCTGCCCTTTACTGTGACCATTTGTCTGCATCCACTTCGTCCTCCCTCTCATCATAGTCGGTTATTGCTACACAAAAATC  
TGGATCAAAGTGTGGCAGACCGGGACCCAGCTGGACAGAAATCCTGACAACCCAGTTTGCTGAGGTTTCGAAATTTTCTAACCCATGT  
TTGTGATCTTCCTCCTT

**Fig. 2C**

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**FIG. 3**

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FIG. 4A



**Applicants:** David White

**Serial No.:** 10/666,807

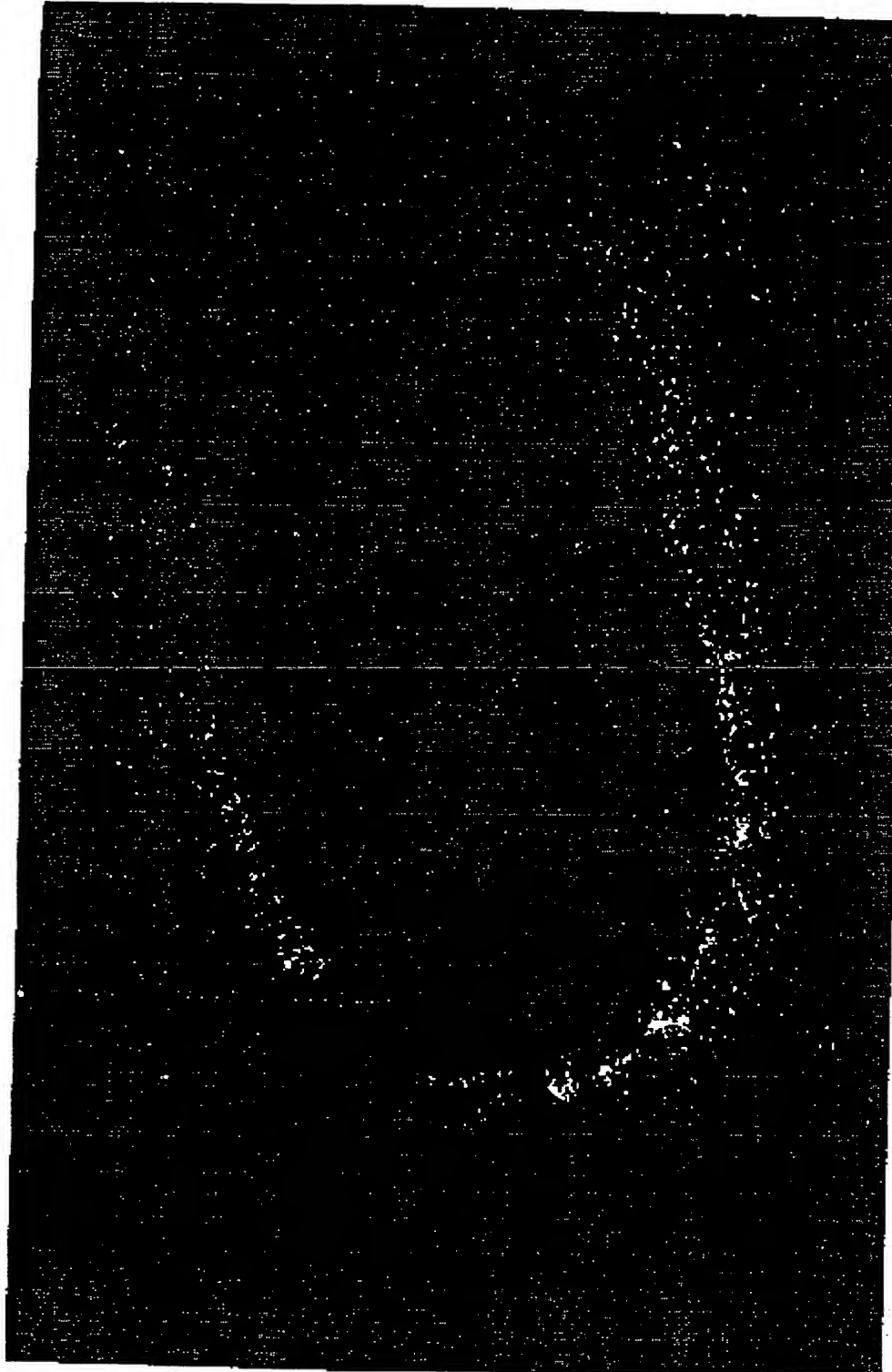
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**FIG. 4B**

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FIG. 4C

**Applicants:** David White

**Serial No.:** 10/666,807

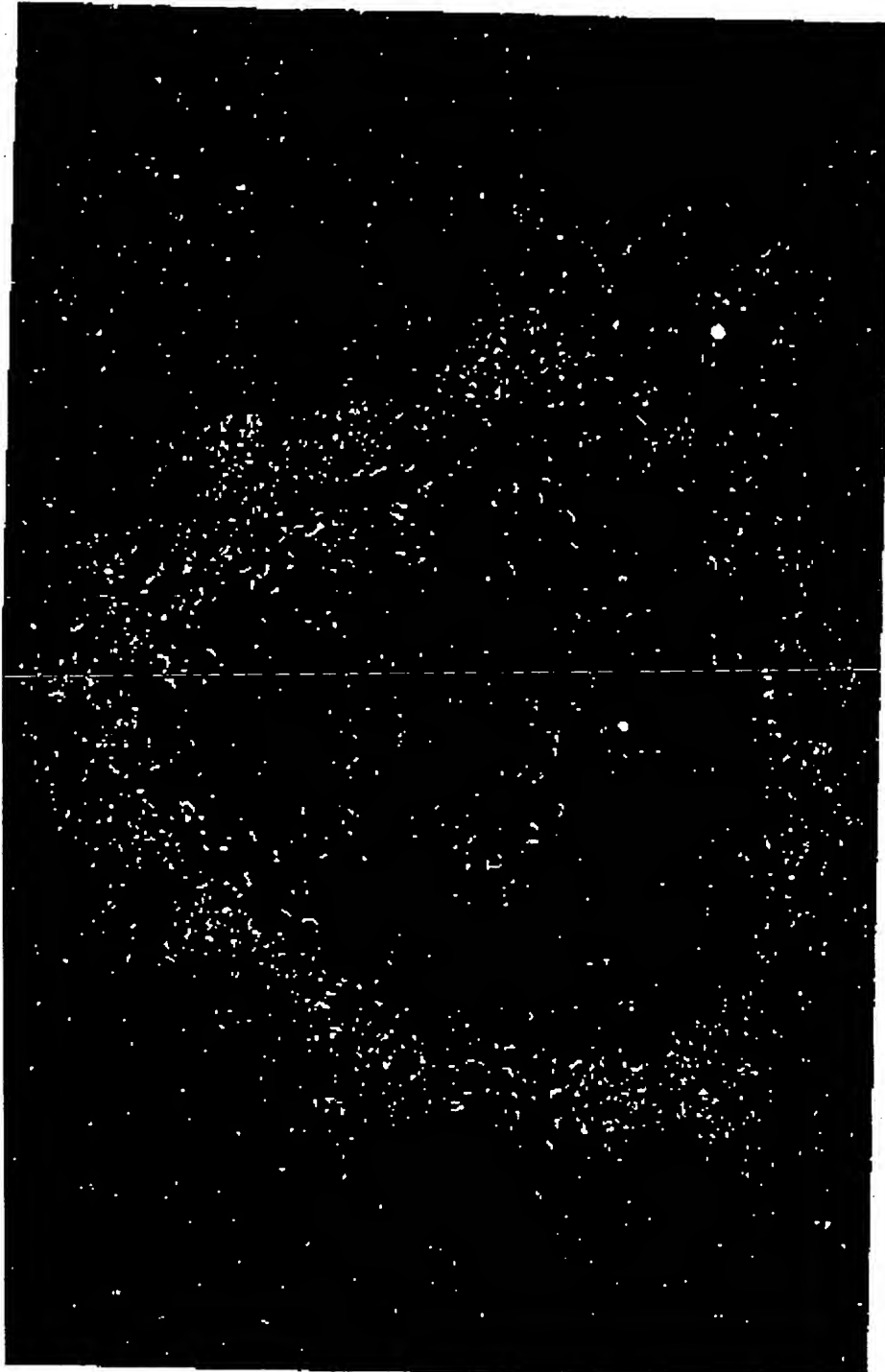
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**FIG. 4D**

```
AF003625 27599 tgtttgctgtctggacctggctgctgacccctgacccctgctgggagatcttaacgatcccc
U52219 1 |||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
tgtttgctgtctggacctggctgctgacccctgacccctgctgggagatcttaacgatcccc

AF003625 27659 aggagcaacatggggccaccctagcgggtcccccctatggctgtattggctgtaag
U52219 61 |||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
MRR AA 1 aggagcaacatggggccaccctagcgggtcccccctatggctgtattggctgtaag
M G P T L A V P P T P Y G C I G C K

AF003625 27719 ctacccagccagaataccaccggctctaatcatctttatgttctgcgcgatggttatc
U52219 121 |||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
MRR AA 18 L P Q P E Y P P A L I I F M F C A M V I

AF003625 27779 accatcggttagaccctaatacggcaactcccatggctcattttggctgtgacgaagaacaag
U52219 181 |||||||||||||||||||||||||||||||||||||||||||||||||||||||||||
MRR AA 38 accatcggttagaccctaatacggcaactcccatggctcattttggctgtgacgaagaacaag
T I V V D L I G N S M V I L A V T K N K
```

Fig. 5A

AF003625	27839	aagctccggaattctgg 
U52219	241	aagctccggaattctgg
MRR AA	58	K L R N S G

AF003625	30712	ttcaggcaacatcttcgtggtcagtcctctgtggccgatatcctggtggccatctaccc
U52219	252	ttctggcaacatcttcgtggtcagtcctctgtggccgatatcctggtggccatctaccc
MRR AA	62	S G N I F V V S L S V A D M L V A I Y P

Accession	Position	Sequence
AF003625	30772	ataccctttgatgctgcattgccatgtccattgggggctgggatctgagccagttacagt 
U52219	312	ataccctttgatgctgcattgccatgtccattgggggctgggatctgagccagttacagt Y P L M L H A M S I G G W D L S Q L Q C

AF003625 30832 ccagatggtcgggttcattcacagggctgagtggtcggtccatcttcaacatcgtggg  
|||||  
U52219 372 ccagatggtcgggttcattcacagggctgagtggtcggtccatcttcaacatcgtggc  
102 Q M V G F I T G L S V V G S I F N I V A

**Fig. 5B**

AF003625	30892	aatcgctatcaaccggttactgctacatctgccacagcctccagtaacgaacggaatcttcaag 
U52219	432	aatcgctatcaaccggttactgctacatctgccacagcctccagtaacgaacggaatcttcaag 
MRR AA	122	I A I N R Y C Y I C H S L Q Y E R I F S
AF003625	30952	tgtgcgcaatacctgcatctacctgggtcatcacctggatcatgaccgtcctggctgtcct 
U52219	492	tgtgcgcaatacctgcatctacctgggtcatcacctggatcatgaccgtcctggctgtcct V R N T C I Y L V I T W I M T V L A V L
MRR AA	142	
AF003625	31012	gcccacaatgtacattggcaccatcgagtagcatcctcgcacctacacctgcatcttcaa 
U52219	552	gcccacaatgtacattggcaccatcgagtagcatcctcgcacctacacctgcatcttcaa P N M Y I G T I E Y D P R T Y T C I F N
MRR AA	162	
AF003625	31072	ctatctgaacaaccctgtcttcaactgttaccatcgtctgcattccacttcgtcctccctct 
U52219	612	ctatctgaacaaccctgtcttcaactgttaccatcgtctgcattccacttcgtcctccctct Y L N N P V F T V T I V C I H F V L P I
MRR AA	182	

**Fig. 5C**

AF003625	31132	cctcatcgtgggtttctgctacgtgaggatctggaccaaagtctggcgcccgtagacc
U52219	672	cctcatcgtgggtttctgctacgtgaggatctggaccaaagtctggcgcccgtagacc
MRR AA	202	L I V G F C Y V R I W T K V L A A R D P
AF003625	31192	tgcagggcagaatcctgacaaccaacttgctgaggttcgcaattttctaaccatgtttgt
U52219	732	tgcagggcagaatcctgacaaccaacttgctgaggttcgcaattttctaaccatgtttgt
MRR AA	222	A G Q N P D N Q L A E V R N F L T M F V
AF003625	31252	gatcttcctcctctttgcagtgctggtgccctatcaacgtgctcactgtcttggtggc
U52219	792	gatcttcctcctctttgcagtgctggtgccctatcaacgtgctcactgtcttggtggc
MRR AA	242	I F L L F A V C W C P I N V L T V L V A
AF003625	31312	tgtcagtcgccgaaggagatggcaggcaagatccccaaactggctttatcttgcagccactt
U52219	852	tgtcagtcgccgaaggagatggcaggcaagatccccaaactggctttatcttgcagccactt
MRR AA	262	V S P K E M A G K I P N W L Y L A A Y F

Fig. 5D

AF003625	31372	catagcctacttcaacagctgcctcaacgctgtgatctacgggctcctcaatgagaattt
U52219	912	catagcctacttcaacagctgcctcaacgctgtgatctacgggctcctcaatgagaattt
MRR AA	282	I A Y F N S C L N A V I Y G L L N E N F
AF003625	31432	ccgaagagaatactggaccatcttccatgctctatgcggcaccctatcataattctctctgg
U52219	972	ccgaagagaatactggaccatcttccatgctctatgcggcaccctatcataattctccctgg
MRR AA	302	R R E Y W T I F H A M R H P I I F F P G
AF003625	31492	cctcatcagtgatattcgtgagatgcaggagggcccgtaacctggcccgcccggtgcccc
U52219	1032	cctcatcagtgatattcgtgagatgcaggagggcccgtaacctggcccgcccggtgcccc
MRR AA	322	L I S D I R E M Q E A R T L A R A R A H
AF003625	31552	tgctcgcgaccaagctcgtgaacaagaccgtgcccattgcctgtcctgtgtgaggaaac
U52219	1092	tgctcgcgaccaagctcgtgaacaagaccgtgcccattgcctgtcctgtgtgaggaaac
MRR AA	342	A R D Q A R E Q D R A H A C P A V E E T

Fig. 5E



```
AF003625 31612 cccgatgaatgtccggaatgttccattacctggtgatgtgcagctggccaccccgaccg
1152 |||||||
MRR AA 362 cccgatgaatgtccggaatgttccattacctggtgatgtgcagctggccaccccgaccg
P M N V R N V P L P G D A A A G H P D R

AF003625 31672 tgcctctggccaccctaaagccccattccagatcctcctctgcctatcgcaaatctgcctc
1212 |||||||
MRR AA 382 tgcctctggccaccctaaagccccattccagatcctcctctgcctatcgcaaatctgcctc
A S G H P K P H S R S S S A Y R K S A S

AF003625 31732 taccaccacaagtctgtctttagccactccaaggctgcctctggtcacctcaagcctgt
1272 |||||||
MRR AA 402 taccaccacaagtctgtctttagccactccaaggctgcctctggtcacctcaagcctgt
T H H K S V F S H S K A A S G H L K P V

AF003625 31792 ctctggccactccaagcctgcctctgtggtcacccccaagtctgccactgtctaccctaagcc
1332 |||||||
MRR AA 422 ctctggccactccaagcctgcctctgtggtcacccccaagtctgccactgtctaccctaagcc
S G H S K P A S G H P K S A T V Y P K P
```

Fig. 5F

```
AF003625 31852 tgcctctgtccatttcaaggctgactctgtccatttcaagggtgactctgtccatttcaa
U52219 1392 |||||
MRR AA 442 tgcctctgtccatttcaagggtgactctgtccatttcaagggtgactctgtccatttcaa
A S V H F K G D S V H F K G D S V H F K

AF003625 31912 gcctgactctgttcatattcaagcctgttccagcaaccccaagcccatcactggccacca
U52219 1452 |||||
MRR AA 462 gcctgactctgttcatattcaagcctgttccagcaaccccaagcccatcactggccacca
P D S V H F K P A S S N P K P I T G H H

AF003625 31972 tgtctctgtggcagccactccaagtctgccttcagtgtgccaccagccaccctaaacc
U52219 1512 |||||
MRR AA 482 tgtctctgtggcagccactccaagtctgccttcagtgtgccaccagccaccctaaacc
V S A G S H S K S A F S A T S H P K P

AF003625 32044 catcaagccagctaccagccatgtgtgagccaccactgtgactatcccaagcctgccac
U52219 1572 |||||
MRR AA 502 catcaagccagctaccagccatgtgtgagccaccactgtgactatcccaagcctgccac
I K P A T S H A E P T T A D Y P K P A T
```

Fig. 5G

AF003625	32104	taccagccaccctaagcccactgctgctgacaaccctgagctctctgcctccattgccc
U52219	1632	taccagccaccctaagcccgcgctgctgctgacaaccctgagctctctgcctccattgccc
MRR AA	522	T S H P K P A A A D N P E L S A S H C P
AF003625	32164	cgagatccctgccattgccaccctgtgtctgacgacagtgacctccctgagtcggcctc
U52219	1692	cgagatccctgccattgccaccctgtgtctgacgacagtgacctccctgagtcggcctc
MRR AA	542	E I P A I A H P V S D D S D L P E S A S
AF003625	32224	tagccctgccgctgggccaccacccctgctgccagccagctggagctgacaccatcgc
U52219	1752	tagccctgccgctgggccaccacccctgctgccagccagctggagctgacaccatcgc
MRR AA	562	S P A A G P T K P A A S Q L E S D T I A
AF003625	32284	tgaccttcctgacctactgtagtcactaccagtagtaccatgattaccatgctcgtggt
U52219	1812	tgaccttcctgacctactgtagtcactaccagtagtaccatgattaccatgctcgtggt
MRR AA	582	D L P D P T V T T S T N D Y H D V V V

Fig. 5H

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**Fig. 5I**